DOCUMENT RESUME

ED 242 663 SP 023 848

AUTHOR	Meyer, James H., Comp.
TITLE	Cardiovascular Disease and Cancer: Student Awareness Activities.
INSTITUTION	Area Education Agency 7, Cedar Falls, IA.
PUB DATE	17 Jun 81
NOTE	38p.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051) -- Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Cancer; *Cardiovascular System; Class Activities; Disease Control; *Disease Incidence; *Diseases; *Health Education; Heart Rate; High Schools; Human Body; Learning Activities; Life Style; Physical Fitness; Physical Health; *Prevention; Science Activities
IDENTIFIERS	Blood Pressure Determination; PF Project

ABSTRACT

Awareness activities pertaining to cancer and cardiovascular disease are presented as a supplement for high school science classes. The exercises can be used to enrich units of study dealing with the circulatory system, the cell, or human diseases. Eight activities deal with the following topics: (1) cardiovascular disease risk factors; (2) cardiovascular fitness; (3) cardiovascular responses (blood pressure and heart rate); (4) the incidence of cancer correlated with age; (5) the incidence of cancer correlated with life-style factors; (6) clues to cancer prevention; (7) the incidence, diagnosis, and prognosis of cancer; and (8) an overview of cancer. Most of the activities can be completed in a 55-minute class period and permit teacher-student question and discussion time. The activity providing an overview of cancer requires more than one class period to allow for out-of-class research. Suggested answers and conclusions for each activity and a list of pamphlets on cancer awareness with availability information are included. This document is part of a collection of materials from the Iowa Area Education Agency 7 Teacher Center project. (JW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Ronald Dickinson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED242663

CARDIOVASCULAR DISEASE AND CANCER:

STUDENT AWARENESS ACTIVITIES

COMPILED BY:

James H. Meyer
Science Teacher
Cedar Falls High School
Cedar Falls, Iowa 50613

SPONSORED BY:

The Teacher Center
2201 E. Mitchell Avenue
Waterloo, Iowa 50702

SP 023 848

AREA EDUCATION AGENCY 7

Cedar Falls, Iowa

Document title: Cardiovascular Disease and Cancer: Student Awareness Activities

Author(s): James Meyer

Developed with funds provided by a federal Teacher Center grant contract under the provisions of the Higher Education Act of 1965.

AEA 7 Teacher Center
Waterloo, Iowa
Sept. 15, 1978 to Aug. 15, 1983

Teacher Center Policy Board Chair - Doris Mauer
Teacher Center Director - Diane Gibson, Ed. D.

Ronald Dickinson, Ed. D.- Chief Administrator, AEA 7

Health Awareness Activities

The leading causes of death among Americans are the cardiovascular diseases (50%) and cancer (21%). Most secondary students are likely to have relatives and/or friends with these diseases. This fact would seem to indicate that students should have a natural curiosity about these two groups of common maladies.

The purpose of the awareness activities is to supplement health related information presented in science classes. The exercises can be used to enrich units of study dealing with the circulatory system, the cell, or human diseases. The materials are designed to get students actively involved in the subject at hand rather than passively listen to information relayed by the teacher. Hopefully the activities will stimulate class discussions and increase the number of student originated questions. Ideally the eight exercises will encourage students to develop a greater interest and concern for topics that are closely related to their present and future well being.

Allowing for teacher-student question and discussion time, most of the activities can be completed in one 55 minute class period. The activity entitled A Cancer Overview will take more than one class period as students must locate quite a bit of requested information.

Health Awareness Activities

Activity 1 - Cardiovascular Disease Risk Factors

Activity 2 - Cardiovascular Fitness

Activity 3 - Cardiovascular Responses - Blood Pressure and Heartrate

Activity 4 - Age and Cancer Incidence

Activity 5 - Lifestyle Factors and Cancer Incidence

Activity 6 - Clues to Cancer Prevention

Activity 7 - Cancer Incidence, Diagnosis, and Prognosis - Some Relationships

Activity 8 - A Cancer Overview

Submitted to the Teacher Center by

James H. Meyer
506 Barbara Drive
Cedar Falls, Iowa 50613

June 17, 1981

Cardiovascular Disease Risk Factors

Activity Insights

1. What are the major risk factors associated with cardiovascular disease?
2. How can one reduce the influence of certain risk factors?
3. How does your relative risk compare with other class members?

Background Information

The general term cardiovascular (CV) disease refers to ailments of the heart and blood vessels. Some common examples include coronary artery diseases, high blood pressure, stroke, and congestive heart failure. Diseases of the heart usually resulting from deposits blocking the coronary arteries kill about 720,000 Americans each year. This figure represents close to 40% of all deaths.

A person's lifestyle over many years has a major influence on his/her chances of developing circulatory system diseases. Medical research has discovered a number of risk factors. Some of these factors are inherited and nothing can be done to reduce their influence on health. These are known as uncontrollable risk factors. However, there are several risk factors that can be controlled and influenced by one's lifestyle. By becoming familiar with the self-controllable risk factors you can decide what your risks are; and - if your risk is high - you may want to change your lifestyle.

Procedure

Listed below are a number of CV disease risk factors that have been identified. Read the information about each one. Decide to what degree each one applies to you. Then, determine the number

of risk points applicable to you for each risk factor. Finally, add up your score for all categories and compare it with the risk table.

UNCONTROLLED RISK FACTORS

1. What is your age?

As a person ages the risk of CV disease increases.

Choose your category	Risk points
10-20 years of age	1
21-30 years of age	2
31-40 years of age	3
41-50 years of age	4
51-60 years of age	6
61 and over	8

2. Do you have a family history of heart disease?

If genetic relatives have had a history of CV disease you are at greater risk. Only your parents, grandparents, brothers, and sisters should be counted.

Choose your category	Risk points
No history of heart disease	1
One relative with CV disease over 60	2
Two relatives with CV disease over 60	3
One relative with CV disease under 60	4
Two relatives with CV disease over 60	6
Three relatives with CV disease under 60	7

3. Are you a male?

Males are at greater risk for CV disease than females. For example, between the ages of 30 and 44 twenty-four males will have a heart attack for every female so afflicted.

Choose your category	Risk points
Female	1
Female over 45	2
Male	4

* From RISKO - Michigan Heart Association

CONTROLLABLE RISK FACTORS

4. Do you smoke cigarettes?

The chemicals in tobacco smoke cause damage to the artery walls and speed up the development of atherosclerosis (the inner layer of the artery wall becomes thick and irregular from the piling up of fatty deposits eventually leading to a blockage of blood flow). Cigarette smoking also reduces the amount of oxygen in the blood leading to an increased workload on the heart.

Choose your category	Risk points
non-smoker	0
cigar and/or pipe	1
10 cigarettes or less per day	2
20 cigarettes per day	4
30 cigarettes per day	6
40 or more cigarettes per day	10

5. Are you overweight?

Being overweight is linked to CV disease. Excess weight makes the heart work harder as it must pump blood through the vessels in the added fat tissue. Obesity is also related to elevated blood pressure, diabetes, and elevated blood fats which are all risk factors in themselves.

Choose your category	Risk points
-5 to +5 standard weight	1
6-20 pounds overweight	2
21-35 pounds overweight	3
35-50 pounds overweight	5
51-65 pounds overweight	7

6. Do you have high blood pressure (hypertension)?

Constant high blood pressure is the single most important indicator of heart attack. Overweight people are more likely to develop high blood pressure. The amount of salt consumed in the diet is also a factor in the cause and control of high blood pressure. High blood pressure can be successfully treated with the use of certain drugs.

Choose your category	Risk points
systolic or upper reading 100	1
systolic or upper reading 120	2
systolic or upper reading 140	3
systolic or upper reading 160	4
systolic or upper reading 180	6
systolic or upper reading 200	8

7. Do you exercise regularly?

Although the reasons are still unclear, active people seem to have a somewhat lower incidence of heart disease.

Choose your category	Risk points
Intensive occupational and recreational exercise	1
Moderate occupational and recreational exercise	2
Sedentary work and intense recreational exercise	3
Sedentary work and moderate recreational exercise	5
Sedentary work and light recreational exercise	6
Complete lack of exercise	7

8. Do you overconsume certain foods?

Certain fats and perhaps sugar are related to your CV disease health and risk. In some individuals diets high in saturated fats may lead to high levels of blood fat such as cholesterol. High levels of blood cholesterol are linked to an increase in CV disease risk. Persons with high blood cholesterol can reduce it by reducing certain foods in their diet. Foods high in saturated fats - usually of animal origin - should be reduced. These would include butter, whole milk, bacon, egg yolks, cream, lard, fatty meats, and suet. It is estimated that the average American diet contains 33% fat.

Choose your category	Risk points
Diet contains no animal or solid fats	1
Diet contains 10% animal or solid fats	2
Diet contains 20% animal or solid fats	3
Diet contains 30% animal or solid fats	4
Diet contains 40% animal or solid fats	5
Diet contains 50% animal or solid fats	8

9. Are you an aggressive personality?

There is some evidence that a person with a hard-driving, aggressive personality (Type A) is at greater risk of CV disease than an easy going opposite (Type B).

Choose your category	Risk points
Type B personality	2
Mixture of type B and A	4
Type A personality	6

10. Has your electrocardiogram (EKG) ever shown any abnormalities?

People with abnormal EKG'S may be at greater risk for heart attack.

Choose your category	Risk points
normal EKG	0
Abnormal EKG	4

RISK FACTOR VALUES

Your Total Score	Risk Level
8-13	Your risk is minimal
14-19	Your risk is below average
20-26	Your risk is average
27-33	Your risk is moderate
34-42	Your risk is at a dangerous level
43-69	Your risk is very dangerous - have you made out a will?

Summary

1. What is your risk factor score?
2. What is your present risk level for CV disease?
3. What is the average score of your class?
4. What is the present risk level of your class?
5. How do you compare with the class average?
6. What is the average risk factor score for the females in the class?
7. At what risk level are the females?
8. What is the average risk factor score of the males in the class?
9. At what risk level are the males in the class?
10. Which controllable risk factors are the most important to monitor?
11. Are there any changes that you can make in your lifestyle that would reduce your risk of CV disease?

As an extension of this activity you can survey other groups in your school and community. For example, compare the relative risk of male and female teachers in your school. Also, you can compare the risks of people in different occupational groups in your community. The results of these studies could provide your class with some interesting data to evaluate.

Cardiovascular Fitness

Activity Insights

1. How efficient is your cardiovascular system?
2. How does the efficiency of your cardiovascular system compare with others in your class?

Background Information

The Harvard Step Test is used to measure how well the circulatory system is functioning. This test was developed during World War II to screen men for overall physical fitness. The test can be used to measure the progress of physical training and to evaluate people for their capacity to do hard work. The test is based on how soon the heart returns to it's at rest rhythm after being physically stressed. The more efficient the cardiovascular system is in carrying oxygen to the cells and carbon dioxide back to the lungs, the faster the heart will recover from the physical stress.

Procedure

Students can work in teams of three. One student is the subject and will be tested. Number two is the timer and number three counts the pulse. A chair, bench, or stool about 18-20 inches high should be obtained. The subject should stand in front of the chair. The timer counts a cadence of "up, 2,3,4" with the up command given every two seconds. The subject should proceed at about 30 steps per minute. After the up and 2 count the subject should be standing on the chair and then return to the floor on the 3 and 4 counts. The subject should continue stepping at the same rate for five minutes or until he/she is unable to maintain the pace. The subjects should

not push themselves beyond their physical capacity. The test is designed so that not all people will complete the five minute period of stepping.

When the subject stops stepping the timer should record the time that has passed (in seconds). The subject should be seated and be allowed to rest for exactly one minute. At the end of the minute rest period the subject's pulse needs to be counted for exactly 30 seconds. The 30 second pulse rate and duration of stepping data can now be matched on the scoring table (Table 1-1) and a physical fitness score and value determined.

Table 1-1

Harvard Step Test Scoring Table

Stepping time in seconds	Heart beats for 30 seconds										
	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
60-89	30	30	25	25	20	20	20	20	15	15	15
90-119	45	40	40	35	30	30	25	25	25	20	20
120-149	60	50	45	45	40	35	35	30	30	30	25
150-179	70	65	60	55	50	45	40	40	35	35	35
180-209	85	75	70	60	55	55	50	45	45	40	40
210-239	100	85	80	70	65	60	55	55	50	45	45
240-269	110	100	90	80	75	70	65	60	55	55	50
270-299	125	110	100	90	85	75	70	65	60	60	55
300	130	115	105	95	90	80	75	70	65	65	60

Your Physical Fitness Score	Your Physical Fitness Value
Below 50	Poor general physical fitness
50-80	Average general physical fitness
Above 80	Good general physical fitness

Summary

1. What is your physical fitness score?
2. What is your general fitness value?
3. What is the average class physical fitness score?
4. What is the average class physical fitness value?
5. What is the average physical fitness score of the the males?
6. What is the average physical fitness score of the females?
7. Is their a significant difference between males and females in their overall physical fitness scores?
8. Outline a program whereby one could improve their physical fitness score.

Cardiovascular Responses - Blood Pressure and Heartrate

Activity Insight

1. What factors operate in the body to increase or decrease blood pressure and heartrate?
2. What is the effect of a prolonged stress on a person's blood pressure and heartrate?

Background Information

With each beat of the heart, a volume of blood flows from the heart's left ventricle into the arteries. The blood rushing into the arteries creates a high pressure called the systolic blood pressure. Between heart contractions the pressure drops in the arteries to a low point called the diastolic blood pressure. There are several factors that operate to constantly change the blood pressures. These factors include: stroke volume, heartrate, peripheral resistance, and total blood volume.

Stroke volume refers to the amount of blood ejected from the left ventricle during each contraction. As more blood is pumped out the pressure rises. Peripheral resistance is created by the size of the many very small arteries or arterioles located throughout the body. For example, as these vessels constrict and get smaller in diameter the overall resistance to blood flow increases and the pressure rises. Dilation of the arterioles results in a pressure decline. Changes in heartrate can also change blood pressure. A rapid heartrate will suddenly force more blood into the arteries creating a pressure rise. However, a very slow heartrate may also raise systolic blood pressure by allowing more time for blood to fill the left ventricle and thereby increase the stroke volume. The overall amount of blood in the body may also affect blood pressure. For

example, a severe blood loss would result in a lower pressure.

Blood pressure is usually measured in the arm's brachial artery using a stethoscope and a device called the sphygmomanometer. The following word equations can help you to remember the important factors that determine blood pressure.

Cardiac output = stroke volume x heartrate

Blood pressure = cardiac output x peripheral resistance

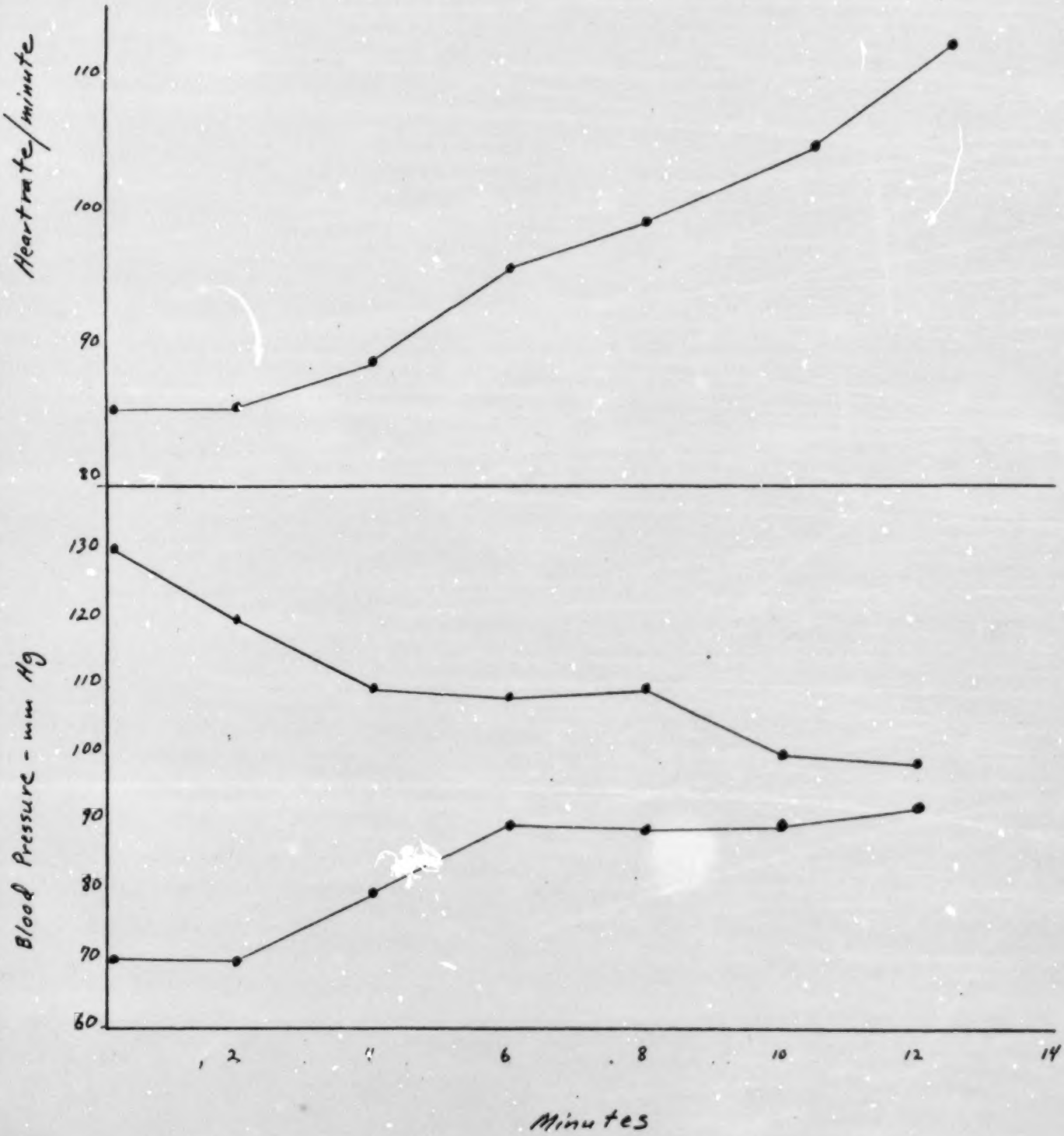
Procedure

Three students should work as a team. Number one being the subject, number two takes the blood pressure, and number three measures the pulse. It is very important that the proper means of taking blood pressures with the sphygmomanometer have been throughly learned and practiced prior to this activity.

In order to measure the effect of standing on the cardiovascular system the test subject must stand motionless for a ten to fifteen minute period of time. Even the toes must not be wiggled as this action will force more blood toward the heart. Remaining motionless will insure that gravity will pull much blood into the lower parts of the body. Should the test subject feel faint at any time, the experiment should be stopped.

First, before standing up, the subject's base heartrate, systolic, and diastolic blood pressure should be measured. Next, the subject should stand motionless against a wall. During the 10-15 minute standing period the heartrate and blood pressure should be measured every two minutes. After this data has been collected, it should be graphed. A suggested method of graphing this data is shown in Figure 1-1.

Figure 1-1 Changes in Blood Pressure and Heartrate While Under Stress



Summary

1. Compare your team's data with other class data. What similarities and/or differences can be noted?
2. How might you account for a rise in heartrate over the test period?
3. In some cases, why did the systolic pressure drop?
4. In some cases, why did the diastolic pressure rise?
5. In many cases, why will prolonged standing result in fainting?
6. What experimental error might account for a lack of any significant changes in heartrate and/or blood pressure with certain subjects?
7. Some people suffer from a continucus abnormally high blood pressure (hypertension). What factors or conditions in the body may be operating to cause this condition?

Age and Cancer Incidence

Activity Insights

1. What areas of the US have the highest incidence of deaths due to cancer?
2. What areas of the US have the most elderly population?
3. Is there a relationship between one's age and the risk of death from cancer?

Background Information

Approximately 21% of all deaths occurring in the US annually are due to cancer. This amounts to around 390,000 people dying from the disease every year. Over the decades of the 20th century the percentage of total deaths due to cancer has been increasing. At the same time the average age at death of Americans has also been on the increase. The question can then be asked, is there a relationship between one's age and the risk of dying from cancer? As we get older do our odds of dying from cancer increase? Is there evidence to suggest that the rise in the percentage of deaths due to cancer has been a function of the increasing life span and the greater number of elderly people?

One method of gathering some insight into these questions would be to analyze some population data. If we compare the age of the population in certain states with that state's cancer death rate we may see a relationship.

Procedure

Using the data provided in Table 1-1, construct a line graph comparing those states with the oldest and youngest population with their cancer death rates. Have the vertical axis represent the cancer

death rate. The age data goes on the horizontal axis. Plot one point for each relationship. There will be twenty-two points on the graph.

Table 1-1

State	Percent of population over 65	Cancer death rate per 100,000 population
New York	12	209
New Jersey	11.5	211
Maryland	9.2	181
Rhode Island	13.2	247
South Carolina	9.2	156
Iowa	13.1	196
Louisiana	9.4	184
Missouri	13	190
Oklahoma	12.5	198
South Dakota	13.1	188
Nebraska	13	186
Kansas	12.7	189
Florida	18.1	245
Pennsylvania	12.7	212
Arkansas	13.7	200
Alaska	2.6	72
Hawaii	7.7	126
Nevada	8.6	178
Utah	7.7	111
New Mexico	8.8	126
Colorado	8.6	124
Wyoming	8.1	157

Summary

1. Which states have the highest cancer death rates?
2. Which states have the lowest cancer death rates?
3. Which states have the most elderly population?
4. Which state has the youngest population?
5. What sort of relationship exists between average age and the cancer death rate?
6. Are there any states that do not conform to the average age-cancer death rate relationship?
7. Can you think of any other factors that might increase or decrease the average cancer death rate among a state's population? (Clue: What states are the most industrially oriented?)

Lifestyle Factors and Cancer Incidence

Activity Insights

1. Can the frequency of certain types of cancer be linked to lifestyle?
2. Can we learn about cancer causes by comparing the incidences of certain cancers in a population with various lifestyles?

Background Information

Two of the most common types of cancer are lung and colon-rectum. The incidence of lung cancer in the US has been increasing at a dramatic rate for the past fifty years. The incidence of colon-rectum cancer has remained fairly constant over the years. If the incidence of these cancers is examined throughout the world we find great differences from country to country. These variations are well worth the further study of cancer researchers. By comparing the incidence of cancers in a population to such factors as foods consumed, living habits, occupation, local environmental factors, heredity, and social factors, clues to the causes of certain cancers may be uncovered.

Therefore, let us compare the incidences of lung and colon-rectum cancer in various countries with certain habits of the people. First, we will compare the average number of cigarettes smoked per year per person in 1930 with the lung cancer death rate in 1960. Since lung cancer usually takes a number of years to develop we will allow for a 30 year developmental period. Second, let us compare the annual meat consumption with the incidence of colon cancer in several countries. Possibly some relationships can be seen with these two types of cancer.

Procedure

Construct a graph for each set of data shown in Tables 1-1 and 1-2. Have the vertical axis represent the incidence of cancer. The lifestyle data (cigarettes smoked or meat consumed) goes on the horizontal axis. Plot one point for each relationship. Each graph will have ten points.

Table 1-1

Country	Average number of cigarettes smoked per person 1930	Lung cancer deaths per 100,000-1960
Italy	420	30
US	1400	40
Canada	700	33
Great Britain	1600	70
Finland	1350	60
France	500	25
Portugal	275	10
Sweden	400	18
Austria	850	50
Australia	420	38

Table 1-2

Country	Amount of meat eaten per day (grams)	Colon cancer incidence per 100,000 population
Columbia	80	5
US	280	33
Canada	240	30
New Zealand	318	42
Great Britain	200	22
Israel	130	16
Nigeria	20	1
Chile	80	7
Denmark	180	24
Sweden	140	19

Summary

After completing the graphs write a conclusion about each. Discuss the cancer incidence - lifestyle relationship shown by each set of data.

Clues to Cancer Prevention

Activity Insights

1. What are some of the risk factors that have been associated with certain types of cancer?
2. What changes in one's lifestyle can be made to reduce the risk of developing cancer?

Background Information

Without question we are exposed to carcinogens (cancer causing substances) in the environment and in our daily lifestyles that increase our chances of getting cancer. It would be foolish of us to ignore this truth. A better move is to learn what we can about proven cancer risk factors. Then, it will be possible for us to alter our lifestyles within reason and still enhance our chances of avoiding the disease.

By and large our best insight into cancer prevention comes from studying groups of people with high rates of the disease. By observing these special segments of humanity, we can detect certain factors that make them more prone to a type of cancer. In general, these factors fall into one of three categories: lifestyle, environment, or inheritance. As an introduction to cancer prevention, then, let's look at some actual research studies and the information gathered that sheds some light on the problem.

Procedure

Read the articles that deal with factors that seem to be related to cancer causation. Also, look at the table listing risk factors associated with some common types of cancer. Next, look at the summary section and read through the list of people with lifestyles or circumstances that may be associated with particular kinds of

cancer. Using the information presented in the articles and risk factor table, write down a type of cancer that could be associated with each lifestyle example. Be prepared to support your answer with the appropriate references.

Summary

Individual lifestyles and/or occupational-environmental circumstance.	Associated type of cancer
1. A woman who is overweight.	
2. The non-smoking members of a family where one member smokes.	
3. Men working in the dry cleaning industry or with gasoline products.	
4. Women working as beauticians and cosmetologists.	
5. Having your first baby later in life (after 30).	
6. A male who is overweight.	
7. A male with a high dietary fat intake.	
8. A person who inhales asbestos fibers on the job.	
9. Heavy drinking of alcohol along with smoking.	
10. High beef diet with low fiber intake.	
11. Being a farmer.	
12. A female with multiple sex partners.	
13. Excessive sun bathing.	
14. Female with a high dietary fat intake.	
15. Exposure to large doses of radiation.	

Risk Factors Associated With Some Common Types of Cancer

Skin cancer

1. Sex: higher incidence in men
2. Light complexion
3. Living in a warmer climate
4. Exposure to chemicals such as arsenic and coal tar

Lung cancer

1. Family history (parents, brothers and sisters)
2. Smoking tobacco products
3. Exposure to cancer causing chemicals on the job

Breast cancer (females)

1. Family history of breast cancer (mother, sister)
2. Early menstrual flow (12 or younger)
3. Menopause after age 54
4. Having the first child after age 30
5. Having no children
6. High fat diet
7. Obesity

Colon-rectum cancer

1. Family history (parents, brother, sister)
2. Ulcerative colitis
3. High fat and protein diet with a low fiber content
4. Over age 40

Uterus(cervix) cancer

1. Sexual intercourse before age 18
2. Many sexual partners
3. Many pregnancies
4. Venereal disease

Cancer Incidence, Diagnosis, and Prognosis - Some Relationships

Activity Insights

1. What are the most common types of cancer?
2. What types of cancer have a good prognosis?
3. What types of cancer have a poor prognosis?
4. How is cancer diagnosis related to cancer prognosis?

Background Information

There are over 100 known types of cancer. However, only a few have a high incidence. In fact, the most common fifteen kinds account for over 90% of all cancers. See Table 1-1.

Once a tumor (a mass of cells) is diagnosed as being malignant (containing cancer cells), the prognosis (the prediction of the course of the disease) will depend on several factors. The prognosis of a cancer patient can range from very good to very poor and even terminal. Two important facts determine the forecast. First, the location of the abnormal cells is critical. Second, a cancer's stage of development is also significant.

Why should the location of a cancer influence its chance of being successfully treated? One reason is certainly tied to ease of diagnosis and treatment. Cancers that can be readily cut out or irradiated without disturbing a vital organ will have a better prognosis than those which cannot. For instance, most skin cancers are highly curable. By nature of their location they can be spotted early and given unhampered care. Brain tumors, however, are fairly easy to diagnose but difficult to reach and treat. As a result, the chance for long term survival among such cancer victims is only one

in four.

We said that the stage of a tumor's growth also affects a victim's outlook. It is believed that cancers start in a specific area of the body from one abnormal cell. In time this cell divides and becomes a mass of cells. At first these irregular units remain localized but eventually they tend to spread throughout the body. Obviously, the less a cancer has spread the better will be the prognosis. Tracing the whereabouts of a tumor that has scattered can be difficult. Treating it in many different tissue types can be more ticklish yet.

Finally, the term cancer "cure" must be defined. Actually doctors are reluctant to speak in terms of a permanent cure. They believe it wiser to simply increase the odds for survival the longer a patient remains free from cancer after diagnosis and treatment. Generally speaking it is unlikely for a malignancy to recur if one can reach a five year period free from it. Table 1-2 shows the five year survival rates for major cancer sites when in a localized or regional (some spreading) state of development. Table 1-3 shows for various cancer sites the percentage of cases diagnosed in the local, regional, or distant (widespread) stages.

Table 1-1 Leading Sites for Cancer Development in Males and Females

Males	Females
1. lung (22%)	1. breast (27%)
2. prostate gland (17%)	2. colon-rectum (15%)
3. colon-rectum (14%)	3. uterus (13%)
4. urinary organs (10%)	4. lung (8%)
5. blood and lymph tissues (8%)	5. blood and lymph tissues (7%)
6. mouth (5%)	6. ovary (4%)
7. stomach (4%)	7. urinary organs (4%)
8. pancreas (3%)	8. pancreas (3%)
9. larynx (2.3%)	9. stomach (2%)
10. skin (2%)	10. thyroid (1.6%)
11. brain (1.7%)	11. brain (1.3%)
12. esophagus (1.6%)	12. liver (1%)
13. liver (1%)	13. esophagus (.6%)
14. thyroid (.7%)	14. connective tissue (.5%)
15. connective tissue (.6%)	15. larynx (.5%)
16. bone (.3%)	16. bone (.2%)

Table 1-2

Five Year Survival Rates For Major Sites (In percent)

Sites	Average of All Stages	Localized	Regional (Some Spreading)
lip	84	87	66
mouth	45	64	38
esophagus	3	4	5
stomach	13	40	14
colon-rectum	45	71	43
liver	7	22	3
pancreas	1	5	3
larynx	61	77	36
lung	11	39	12
breast (female)	65	85	56
uterus (female)	66	83	46
ovary (female)	34	78	43
prostate (male)	57	70	61
bladder	62	73	20
brain	28	28	28
thyroid gland	84	98	85
Hodgkins disease	55		
leukemia (all types)	15		

Table 1-3

Percent of Cancer Cases By Site By Stage at Diagnosis

Site	Local	Regional	Distant
lip	84	10	4
mouth	44	37	15
esophagus	27	18	33
stomach	18	28	46
colon-rectum	44	26	25
liver	26	25	25
pancreas	15	14	61
larynx	62	26	8
lung	17	22	48
breast (female)	48	41	9
uterus	63	23	12
ovary	25	6	64
prostate (male)	61	13	21
bladder	82	9	6
brain	88	9	1
thyroid gland	54	30	14

Summary

1. What is meant by the term prognosis?
2. Why can localized cancers usually be successfully treated?
3. Why is the prognosis usually very poor for distant staged cancers?
4. What is really meant when we speak of a cancer "cure"?
5. What are two types of cancer that have a high survival rate?
6. Name three cancers that have a poor five year survival outlook?
7. Does detection of a cancer in a localized stage always insure a good prognosis? Explain your answer.
8. What types of cancer apparently cause few symptoms or warning signs in their early stages as they have usually spread before detection occurs?
9. In what area(s) of the body do malignant growths usually get detected early?
10. Locate the five body sites that account for the most cancer in males and females. Determine for each type of cancer, and for each sex, the average chances of living five years after diagnosis.

A Cancer Overview

Activity Insights

1. Can I obtain a better overall understanding of the most common types of cancer?
2. How do such aspects as incidence, diagnosis, treatment, prognosis, and prevention differ with each of the most common cancers?

Background Information

Cancer is a group of diseases with many aspects. Each cancer is in some way unique. Symptoms, incidence, diagnosis, treatment, prognosis, and prevention differ with each form of the disease. Therefore, in order to be better informed about the entire scope of several forms of the disease need to be investigated.

Procedure

On the following page are seven questions to answer about the most common types of cancer. Using the information furnished in the phamplets entitled "What You Need to Know About ..." and the tables presented in activity #6 locate the requested data and answer each question for each type of cancer. (See the example dealing with lung cancer.) Make your answers brief.

Summary

Answer the following seven questions for lung cancer.

1. What may be a symptom or sign of the cancer?

   Answer: persistant cough

2. How common is the cancer? (among males and females)

   Answer: first in males, fourth in females

3. What are two possible methods of diagnosis?

   Answer: x-rays, biopsy

4. Are there any known or suggested risk factors that can be associated with this cancer?

   Answer: chemicals in cigarette smoke

5. What is/are the preferred method(s) of treatment?

   Answer: surgery, radiation therapy, chemotherapy

6. What are the chances (%) of surviving for five years?

   Answer: males 8%; females 13%

7. Are there any known preventive measures?

   Answer: do not smoke

Answer the seven questions for the following types of cancer.

bone
brain
colon-rectum
esophagus
Hodgkins disease
leukemia
mouth
prostate
stomach
breast

Health Awareness Activities
Suggested answers - conclusions

Activity 1 - Cardiovascular Disease Risk Factors

#'s 1-9 will vary with each class and individual. Generally, the females will have a lower score and less risk.

#10 smoking, blood pressure, and diet (for certain individuals)

#11 depends on the individual

Activity 2 - Cardiovascular Fitness

#'s 1-7 will vary with each class and individual.

#8 Aerobic exercises such as running, swimming, bicycling, and climbing stairs would improve fitness.

Activity 3 - Cardiovascular Responses - Blood Pressure and Heartrate

#1 answers will vary

#2 As blood pools in the legs the heart's stroke volume is reduced. The resulting reduction in blood flow in the aorta and carotid arteries is detected by special sensory receptors (baroreceptors) which relay this information to the heartrate center in the brain's medulla. The heartrate center in turn sends nerve impulses to the heart's pacemaker increasing it's rate.

#3 The decreased stroke volume would initially drop the systolic pressure. There is less blood to pump out of the heart as less venous blood is returning due to pooling in the lower body.

#4 To compensate for lower stroke volume the arterioles constrict and increase the peripheral resistance resulting in an increased diastolic pressure. The diameter of the arterioles is under control of the autonomic nervous system through nerves running from the brain's medulla.

#5 Not enough oxygenated blood reaches the brain due to a reduced

stroke volume.

#6 The subject is not standing perfectly still. Improper use of the sphygmomanometer and/or stethoscope.

#7 Constant constriction of the arterioles, deposits in the arteries (atherosclerosis), or rapid heartbeat.

Activity 4 - Age and Cancer Incidence

#1 Rhode Island, Florida, Pennsylvania, New Jersey, Arkansas

#2 Alaska, Utah, Colorado, New Mexico

#3 Florida, Arkansas, Rhode Island, Iowa

#4 Alaska, Hawaii, Utah, Wyoming

#5 In most cases there is a direct relationship.

#6 Although Rhode Island has a high percentage of elderly, it's cancer death rate is abnormally high. Wyoming has more cancer deaths than would be expected considering it's young population.

#7 States that have large concentrations of industry tend to have higher cancer incidences. For example, New Jersey has a large chemical industry and it has a very high cancer death rate. Other eastern industrial states such as Rhode Island, New York, and Pennsylvania also have high cancer death rates.

Activity 5 - Lifestyle Factors and Cancer Incidence

Both graphs show a direct relationship between cigarette smoking-lung cancer and meat consumption-colon cancer.

Activity 6 - Clues to Cancer Prevention

1 breast, ovary, pancreas, kidney

2 lung

3 pancreas

4 liver, lung

5 breast

Activity 6 continued

6 prostate gland, colon-rectum

7 colon-rectum, pancreas

8 lung

9 esophagus

10 colon

11 lip, multiple myeloma, prostate gland, leukemia, stomach, lymphatic

12 cervix

13 skin

14 breast

15 skin, lymphatic, leukemia

Activity 7 - Cancer Incidence, Diagnosis, Prognosis

#1 predicted outcome of a disease

#2 easy to identify early and treat

#3 difficult to treat because they may have spread to several vital organs

#4 at least a five year period free of the disease

#5 lip, thyroid gland

#6 pancreas, esophagus, liver

#7 No. Brain tumors are detected soon but the 5 year survival rate is only 25%.

#8 lung, pancreas, stomach

#9 lip, brain, bladder

#10

males	females
1. lung 11%	1. breast 65%
2. prostate gland 57%	2. colon-rectum 45%
3. colon-rectum 45%	3. uterus 66%
4. urinary organs (bladder) 62%	4. lung 11%
5. blood and lymph tissues leukemia 14% Hodgkins disease 55%	5. blood and lymph tissues leukemia 14% Hodgkins disease 55%

Also available:

What You Need To Know About Cancer
What You Need To Know About Cancer of the Bladder
What You Need To Know About Cancer of the Bone
What You Need To Know About Cancers of the Brain and Spinal Cord
What You Need To Know About Cancer of the Breast
What You Need To Know About Cancer of the Colon and Rectum
What You Need To Know About Cancer of the Esophagus
What You Need To Know About Hodgkin's Disease
What You Need To Know About Cancer of the Kidney
What You Need To Know About Cancer of the Larynx
What You Need To Know About Adult Leukemia
What You Need To Know About Childhood Leukemia
What You Need To Know About Non-Hodgkin's Lymphoma
What You Need To Know About Melanoma
What You Need To Know About Cancer of the Mouth
What You Need To Know About Multiple Myeloma
What You Need To Know About Cancer of the Ovary
What You Need To Know About Cancer of the Pancreas
What You Need To Know About Cancer of the Prostate
What You Need To Know About Cancer of the Skin
What You Need To Know About Cancer of the Stomach
What You Need To Know About Cancer of the Testis
What You Need To Know About Wilms' Tumor
What You Need To Know About Cancer of the Uterus

Prepared by:
Office of Cancer Communications
National Cancer Institute
Bethesda, Maryland 20014

Individual copies of the above phamplets are available from:

Office of Cancer Communications
National Cancer Institute
Bethesda, Maryland 20014